REMARKS

The present invention is directed to organic vapor jet printing. Applicants confirm the election of claims 1-20, which are currently pending.

Discussion of Office Action

In an office action dated February 11, 2005, the Office restricted the claims into two groups. Upon Applicants' provisional election of claims 1-20, the Office rejected claims 1-20.

Restriction Requirement

Applicants were required to elect one of the following groups of inventions:

I. Claims 1-20 drawn to methods for depositing an organic film.

II. Claims 21-32 drawn to devices for depositing an organic film.

In a telephone conference on January 14, 2005, Applicants provisionally elected claims 1-20. Applicants hereby confirm the election of claims 1-20 and cancel claims 21-32. Applicants expressly reserve the right to file one or more divisional or continuation application(s) directed to the non-elected subject matter.

Amendments to the Claims

Claim 1 has been amended to rephrase the dynamic pressure element as suggested by the Examiner. Support for this amendment can be found, *inter alia*, in the specification at paragraph 42 and in claim 1 as originally filed.

Claims 1 and 11 have been amended to specify that the method utilizes a transition flow regime or a free molecular flow regime, which is supported by the specification at paragraphs 33 and 41.

Claims 3, 5, 7, and 14 have been amended to rephrase the background pressure element as suggested by the Examiner. Support for this amendment can be found, *inter alia*, in the specification at paragraph 60.

Claim 7 has also been amended to clarify that in this particular embodiment, the method is performed in the vacuum chamber at base pressure, so the base pressure is the background pressure.

Claim 14 has been amended to depend from claim 1.

Claim 18 had been amended to correct a typographical error. Support for this amendment can be found, *inter alia*, in the specification at paragraph 8.

Claim Objections

Claims 1-20 were objected to because of informalities.

Claims 3 and 5 have been amended to recite "a background pressure" rather than "the background atmosphere." The amendment does not change the scope of the claims as originally filed, since the terms are synonymous. *See* paragraph 61.

In claims 1, 3, 5-7, and 14, the Examiner asserts that the terms "the dynamic pressure" and "the background pressure" lack antecedent basis. The claims have been reworded to comply with Examiner's suggestion. Applicants note that the amendments to the phrasing of these terms do not change the scope of the claims as originally filed.

Claim 18 had been amended to provide the proper antecedent basis for "at least about 760 torr" as recited in claim 19.

In view of these amendments, Applicants respectfully request that the claim objections be withdrawn.

35 U.S.C. § 112 Rejection

Claim 7 has been rejected under 35 U.S.C. § 112 for indefiniteness. The "base pressure" is an inherent feature of a vacuum chamber, and thus, it does not require explicit antecedent basis. *See* MPEP 2173.05(e). The base pressure of a vacuum chamber is the pressure inside the vacuum chamber once evacuated as completely as possible.

Applicants have amended claim 7 to clarify that in this particular embodiment, the method is performed in the vacuum chamber at base pressure, so the base pressure is the background pressure. The amendment does not change the scope of the claim as originally filed.

Applicants respectfully request that the indefiniteness rejection be withdrawn.

35 U.S.C. § 102 Rejection

Claims 1-3, 10, 14-18, and 20 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,788,082 to Schmitt ("Schmitt").

In order for a claim to be anticipated under 35 U.S.C. § 102, a single prior art reference must disclose each and every element of the claim in exactly the same way. *See* MPEP § 2131.

Schmitt discloses "depositing from the gas-phase a saturated chemical vapor species onto a substrate material through the use of a high speed jet of inert carrier gas." Col. 2, lines 8-11. Schmitt discloses that the claimed method can be performed "under conditions of lower vacuum than required by other technologies," which required the use of "complicated high vacuum apparatus." Col. 1, lines 17-18; col. 2, line 2.

The Examiner has asserted that the method disclosed by Schmitt inherently results in a dynamic pressure of at least 1 torr as claimed by the present invention. However, the specific dynamic pressure achieved by the present invention is neither explicitly nor implicitly disclosed by Schmitt. Schmitt discloses P_i, the gas pressure upstream of the nozzle, and P_b, the base pressure in the deposition chamber. Col. 13, lines 22-24. Schmitt does not disclose a pressure, different from the background pressure, in the region between the nozzle and the substrate surrounding the carrier gas. Furthermore, as described by Applicants, the dynamic pressure varies in response to parameter changes such as, for example, changes in background pressure, stream velocity, and nozzle-substrate separation, etc." Paragraph 43. Schmitt does not disclose a selection of parameters that would achieve a dynamic pressure of at least 1 torr. Accordingly, Schmitt does not anticipate claims 1 and 2, which recite a dynamic pressure of at least 1 torr and at least 10 torr, respectively.

Furthermore, Schmitt does not disclose a method utilizing a transition flow regime or a free molecular flow regime. The parameters of the present invention are selected such that "the flow undergo[es] a transition from the continuum to the free molecular flow regimes." Paragraph 33. In a continuum flow, the flow behaves as a fluid. *See* Schmitt col. 19, lines 49-56. In contrast, in a transition flow regime or a free molecular flow regime, the flow behaves as a gas, i.e., individual particle interactions affect the flow. *See* paragraph 37. Schmitt describes a continuum flow rather than a transition flow regime or a free molecular flow regime. *See* col. 19, line 49 – col. 20, line 13. Because Schmitt describes a different flow regime, it does not anticipate claim 1.

Claims 3, 10, 14-18, and 20 are not anticipated by Schmitt for at least the reasons set forth above for claim 1, from which they depend.

35 U.S.C. § 103 Rejection

Claims 4-5, 6, 9, and 11-12 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Schmitt and U.S. Patent No. 6,468,605 to Shah et al. ("Shah").

To establish *prima facie* obviousness, the prior art references, when combined, must teach or suggest all the claim limitations, there must be some suggestion or motivation to combine the reference teachings, and a reasonable expectation of success. MPEP § 2143. Respectfully, the Examiner has not set forth a prima facie case of obviousness because neither Schmitt nor Shah teaches or suggests the dynamic pressure or the flow regime recited by the instant claims.

As discussed above, Schmitt does not teach or suggest a dynamic pressure of at least 1 torr as recited by claim 1, from which claims 4-5, 6, and 9 depend. Shah does not teach or suggest this limitation either. Shah discloses a shroud gas which screens and directs an aerosol/mist spray toward the substrate. Col. 3, line 52 – col. 4, line 8. Shah does not teach or suggest a pressure, different from the background pressure, in the region between the nozzle and the substrate surrounding the carrier gas. The Examiner asserts that "the guard gas flow, as disclosed by Shah, would inherently affect the 'dynamic pressure.'" Office Action p. 7. However, the Shah method is directed to aerosol deposition, that is, the deposition of liquid or solid particles in a carrier gas. Aerosol deposition as disclosed by Shah would not achieve a dynamic pressure of at least 1 torr. Thus, neither reference teaches or suggests the dynamic pressure as recited by the instant claims.

Furthermore, Shah also does not disclose a method utilizing a transition flow regime or a free molecular flow regime as claimed. Shah discloses aerosol deposition. An aerosol is a continuum flow that behaves according to fluid dynamic principles. *See, e.g.*, Schmitt col. 19, line 49 – col. 20, line 13. The shroud gas of Shah directs the carrier gas because viscous forces keep the particles moving within the stream line. The present inventors have surprisingly discovered that a guard flow can direct a transition flow regime or a free molecular flow regime. Specifically, without relying on viscous fluid forces, a guard flow can direct a carrier gas by providing a sort of particulate bumper—straying organic molecules bounce off of the

guard molecules and return to the jet flow. It would not have been obvious to one of skill in the art to use a guard flow with a transition flow regime or a free molecular flow regime. Accordingly, claims 11-12 are not obvious in view of Shah.

Claims 7 and 8 were rejected as obvious in view of Schmitt, Shah, and Kirk-Othmer Vacuum Technology ("Kirk-Othmer"). Claims 7, 8, and 9 are not obvious in view of these references at least for the reasons discussed above. The cited references, alone or in combination, do not teach or suggest the dynamic pressure as claimed by the present invention. Kirk-Othmer does not mention dynamic pressure and thus does not overcome this deficiency.

Claims 13 and 19,which depend from claims 11 and 1, respectively, were rejected as obvious in view of additional references. The additional references do not overcome the deficiencies described above.

Applicants respectfully request that the obviousness rejections be withdrawn.

CONCLUSION

In view of the foregoing amendments and remarks, Applicants respectfully submit that the present application is in condition for allowance. Early and favorable action by the Examiner is earnestly solicited. If the Examiner believes that issues may be resolved by a telephone interview, the Examiner is invited to telephone the undersigned at the number below. The undersigned may also be contacted by email at dziker@kenyon.com.

Respectfully Submitted,

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